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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,080	07/01/2003	Dong-Hwan Kim	764-23	5821
7590 06/10/2005			EXAMINER	
Paul J. Farrell DILWORTH & BARRESE, LLP 333 Earle Ovington Blvd. Uniondale, NY 11553			TSAI, CAROL S W	
			ART UNIT	PAPER NUMBER
			2857	
DATE MAILED: 06/10/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/612,080

Applicant(s)

KIM ET AL.

Examiner

Carol S. Tsai

Art Unit

2857

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 29, 2005 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 14-16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,208,147 to Yoon et al. (referred thereafter as Yoon et al.'147) in view of U. S. Publication 2004/0021448 to Bluemel et al.

Yoon et al.'147 disclose a method for evaluating a capacity of secondary batteries of a same group produced under same conditions, the method comprising: (a) partially charging the secondary batteries to have a charge capacity with a voltage less than a full charge voltage (see col. 6, lines 49-52); (b) measuring an impedance spectrum for the batteries partially charged (see col. 6, lines 53-56); (c) determining specific internal resistance components from an equivalent

Art Unit: 2857

circuit model fitted from the measured impedance spectrum to perform a numerical operation (see Figs. 4 and 9; col. 6, lines 61-65; and col. 7, lines 35-45); and (d) comparing the numerical operation value of the resistance components with an initial discharge capacity graph of the batteries to evaluate an initial discharge capacity of unknown batteries of the same group (see Fig. 7; Abstract, lines 1-13; col. 2, lines 35-58; and col. 6, line 61 to col. 7, line 56).

Yoon et al.'147 do not disclose partial charge having at least 60% with a voltage less than a full charge voltage.

Bluemel et al. teach partial charge having at least 60% with a voltage less than a full charge voltage (see paragraph 0020, lines 20-23).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yoon et al.'147's method to include partial charge having at least 60% with a voltage less than a full charge voltage, as taught by Bluemel et al., in order to obtain as high a charge acceptance as possible for the battery (see Bluemel et al. paragraph 0020, lines 23-24)

As to claim 15, Yoon et al.'147 also disclose the impedance spectrum being measured in a frequency range of 10 mHz to 10 kHz (see col. 6, lines 53-56).

As to claim 16, Yoon et al.'147 also disclose the equivalent circuit model used for simulation of the impedance spectrum including model parameters of nonlinear resistors, nonlinear capacitors and nonlinear transfer lines (see col. 5, lines 10-12).

As to claim 19, Yoon et al.'147 also disclose the secondary battery including a lithium ion battery, a lithium polymer battery, a Ni--Cd battery and a NiMH battery (see col. 5, lines 10-12).

Art Unit: 2857

4. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoon et al.'147 in view of Bluemel et al. as applied to claim 14 above, and further in view of U. S. Patent No. 6,160,382 to Yoon et al. (referred thereafter as Yoon et al.'382).

As noted above, Yoon et al.'147 in combination with Bluemel et al. teach all the features of the claimed invention, but do not disclose resistance components and charge transfer resistance components related to a degradation of an electrolyte, a separator or a current collector.

Yoon et al.'382 teach resistance components and charge transfer resistance components related to a degradation of an electrolyte, a separator or a current collector (see Fig. 1 and col. 4, lines 17-23).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yoon et al.'147 in view of Bluemel et al.'s method to include resistance components and charge transfer resistance components related to a degradation of an electrolyte, a separator or a current collector, as taught by Yoon et al.'382, in order to determine characteristic parameters of a charge storage device.

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoon et al.'147 in view of Bluemel et al. as applied to claim 14 above, and further in view of U. S. Publication 2003/0082458 to Oyama.

As noted above, Yoon et al.'147 in combination with Bluemel et al. teach all the features

Art Unit: 2857

of the claimed invention, but do not disclose the discharge capacity graph being a capacity correlation graph obtained from a relationship equation with the initial discharge capacity determined after a discharge performed with a discharge rate of 1.0 C.

Oyama teaches the discharge capacity graph being a capacity correlation graph obtained from a relationship equation with the initial discharge capacity determined after a discharge performed with a discharge rate of 1.0 C (see paragraph 0127).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yoon et al.' 147 in view of Bluemel et al.'s method to include the discharge capacity graph being a capacity correlation graph obtained from a relationship equation with the initial discharge capacity determined after a discharge performed with a discharge rate of 1.0 C, as taught by Oyama, in order that the charging capacity can be set at 80% of that estimated from the amount of the redox active materials.

6. Claims 20-22 and 25 and are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,208,147 to Yoon et al. (referred thereafter as Yoon et al.' 147) in view of U. S. Patent No. 5,998,052 to Yamin.

Yoon et al.' 147 disclose a method for evaluating a capacity of secondary batteries of a same group produced under same conditions, the method comprising: (a) partially charging the secondary batteries to have a charge capacity with a voltage less than a full charge voltage (see col. 6, lines 57-60); (b) measuring an impedance spectrum for the batteries partially charged (see col. 6, lines 57-60); (c) determining specific internal resistance components from an equivalent circuit model fitted from the measured impedance spectrum to perform a numerical operation

Art Unit: 2857

(see Figs. 4 and 9; col. 6, lines 61-65; and col. 7, lines 35-45); and (d) comparing the numerical operation value of the resistance components with an initial discharge capacity graph of the batteries to evaluate an initial discharge capacity of unknown batteries of the same group (see Fig. 7; Abstract, lines 1-13; col. 2, lines 35-58; and col. 6, line 61 to col. 7, line 56).

Yoon et al.'147 do not disclose partial discharge having at least 10% with a voltage less than a full charge voltage.

Yamin teaches partial discharge having at least 10% with a voltage less than a full charge voltage (see col. 5, lines 25-26).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yoon et al.'147's method to include partial discharge having at least 10% with a voltage less than a full charge voltage, as taught by Yamin, in order that the lithium ion rechargeable cell can be significantly less hazardous than at the fully charged state (see Yamin, col. 5, lines 26-28).

As to claim 21, Yoon et al.'147 also disclose the impedance spectrum being measured in a frequency range of 10 mHz to 10 kHz (see col. 6, lines 53-56).

As to claim 22, Yoon et al.'147 also disclose the equivalent circuit model used for simulation of the impedance spectrum including model parameters of nonlinear resistors, nonlinear capacitors and nonlinear transfer lines (see col. 5, lines 10-12).

As to claim 25, Yoon et al.'147 also disclose the secondary battery including a lithium ion battery, a lithium polymer battery, a Ni--Cd battery and a NiMH battery (see col. 5, lines 10-12).

Art Unit: 2857

7. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoon et al.'147 in view of Yamin as applied to claim 20 above, and further in view of U. S. Patent No. 6,160,382 to Yoon et al. (referred thereafter as Yoon et al.'382).

As noted above, Yoon et al.'147 in combination with Yamin teach all the features of the claimed invention, but do not disclose resistance components and charge transfer resistance components related to a degradation of an electrolyte, a separator or a current collector.

Yoon et al.'382 teach resistance components and charge transfer resistance components related to a degradation of an electrolyte, a separator or a current collector (see Fig. 1 and col. 4, lines 17-23).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yoon et al.'147 in view of Yamin's method to include resistance components and charge transfer resistance components related to a degradation of an electrolyte, a separator or a current collector, as taught by Yoon et al.'382, in order to determine characteristic parameters of a charge storage device.

8. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoon et al.'147 in view of Yamin as applied to claim 20 above, and further in view of U. S. Publication 2003/0082458 to Oyama.

As noted above, Yoon et al.'147 in combination with Yamin teach all the features

Art Unit: 2857

of the claimed invention, but do not disclose the discharge capacity graph being a capacity correlation graph obtained from a relationship equation with the initial discharge capacity determined after a discharge performed with a discharge rate of 1.0 C.

Oyama teaches the discharge capacity graph being a capacity correlation graph obtained from a relationship equation with the initial discharge capacity determined after a discharge performed with a discharge rate of 1.0 C (see paragraph 0127).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Yoon et al.'147 in view of Yamin's method to include the discharge capacity graph being a capacity correlation graph obtained from a relationship equation with the initial discharge capacity determined after a discharge performed with a discharge rate of 1.0 C, as taught by Oyama, in order that the charging capacity can be set at 80% of that estimated from the amount of the redox active materials.

Response to Arguments

9. Applicant's arguments filed April 29, 2005 have been fully considered but they are not persuasive.

Applicants argue that Yoon et al.'147 do not teach comparing the numerical operation value of the resistance components with an initial discharge capacity graph of measured battery samples. The Examiner disagrees with Applicants. As set forth above in the art rejection, Yoon et al.'147 do teach comparing the numerical operation value of the resistance components with an initial discharge capacity graph of measured battery samples (see col. 7, lines 34-45; To

Art Unit: 2857

compare the remaining capacity of battery and the numerical value derived from the frequency dependence of real or imaginary part of the internal impedance of battery, obtained or extrapolated from relatively narrow frequency range, instead of calculating model parameters for the impedance spectrum measured in Embodiment 2, the relationship is examined between the imaginary value of impedance in the lower frequency region and the square root of the frequency).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol S. W. Tsai whose telephone number is (571) 272-2224. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571) 272-2216. The fax number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

Application/Control Number: 10/612,080

Page 10

Art Unit: 2857

system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 886-217-9197 (toll-free).



Carol S. W. Tsai
Primary Examiner
Art Unit 2857

cswt
June 9, 2005